

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION SUPPLEMENTAL SPECIFICATIONS

Bid Opening 02-09-01

The following Specifications are supplementary to the 1997 Edition of the *Standard Specifications for Road and Bridge Construction* as they apply to this Contract.

104.02 SUBLETTING OF CONTRACT.

Page 26

02-09-01

Delete Section 104.02 in its entirety and replace with the following:

The Contractor shall not sublet, sell, transfer, assign, or dispose of any portion of the Contract or Contracts without written consent of the Engineer. The maximum percentage that can be sublet shall be 70%, of the Total Contract Amount, excluding any designated specialty items of work. The amount of any specialty items performed shall be deducted from the total original Contract Amount before computing the percentage of work sublet. Requests for permission to sublet shall be submitted to the District Engineer in whose District the Project is located. The request shall be in writing on Department forms accompanied by evidence showing that the organization performing the work is experienced and equipped for such work. Subcontract work shall not begin until the "Request to Sublet" is approved. The following items shall be submitted with the "Request to Sublet" prior to the start of work.

- A A copy of the actual subcontract agreement, and if applicable any lower tier subcontracts.
 - B The Request to Sublet must show the total price subcontracted. The items of work, and quantities of each item subcontracted shall be shown.
 - C. Partial items shall be explained in detail and show the amount of each contract item being subcontracted.
- The Engineer's consent shall in no way be construed to be an endorsement of the subcontractor or its ability to complete the work in a satisfactory manner.

The contractor shall assure that the Subcontractor has received the following provisions:

- A. EEO Affirmative Action Requirements.
- B. Labor Rates form U.S. Department of Labor.
- C Required Contractor Provisions all Federal Aid Construction Contracts (FHWA-1273) and any addendums attached thereto.
- D Other federal aid provisions such as Buy America clauses.

No Subcontracts, or transfer of Contract, shall relieve the Contractor of liability under the Contract Bonds.

105.03 COOPERATION WITH UTILITIES.

Page 36

07-17-98

Delete the first paragraph of Section 105.03 and insert the following:

The Contractor shall notify all utility companies, pipe line owners, or other parties affected, to have all necessary adjustments of public or private utility fixtures, pipe lines, and other appurtenances within or adjacent to the limits of construction made as soon as practicable.

108.04 DETERMINATION AND EXTENSION OF CONTRACT TIME.

Page 62

07-21-00

Delete Section 108.04 H in its entirety and replace with the following:

- H. **Conversion of Days.** When conversion of working days to calendar days or calendar days to working days is necessary, the factor for making such conversions shall be as follows; seven divided by the number of working days specified to be counted per week equals the conversion factor for converting working days to calendar days. The inverse of this formula shall be used when converting from calendar days to working days.

108.04 DETERMINATION AND EXTENSION OF CONTRACT TIME.**Page 63****11-10-99**

Delete the table Schedule of Liquidated Damages in Section 108.04 J. and insert the following:

Original Contract	Amount Liquidated Damages	
Over - To & Including	Calendar Day	Working Day
\$ 0 - \$ 50,000	\$ 105	\$ 155
50,000 - 100,000	210	290
100,000 - 250,000	270	380
250,000 - 500,000	350	500
500,000 - 1,000,000	430	600
1,000,000 - 2,000,000	600	850
2,000,000 - 3,000,000	700	1,000
3,000,000 - 5,000,000	900	1,250
5,000,000 - 7,500,000	1,100	1,500
7,500,000 - Up	1,300	1,820

109.01 MEASUREMENT OF QUANTITIES.**Page 66****06-19-98**

Delete Section 109.01 D. and insert the following:

D. In computing volumes of excavation, the average end area method, prizmoidal method, or other acceptable methods will be used.

109.01 MEASUREMENT OF QUANTITIES.**Page 67****09-18-98
03-12-99**

Delete the first paragraph of Section 109.01 H.5 and insert the following:

For all asphalts except Performance Graded (PG) asphalt, when both samples of bitumen fail to meet any of the governing Specifications except penetration and demulsibility, but the quality deviation is not serious enough to materially affect the work quality, payment for the bitumen will be reduced at a rate of 20% of the invoice price (FOB refinery) per gallon or per ton, for the quantity of bitumen represented by the failing sample. If more than one of the governing specifications fails to meet the specified requirements, the price adjustment will be based on the lowest pay factor determined.

109.01 MEASUREMENT OF QUANTITIES.**Page 68****09-18-98**

Add the following to Section 109.01 H.:

9. The price adjustments for Performance Graded (PG) Asphalts that fail to meet Section 818.02 A.3. shall be as defined in the *NDDOT Procedure for Acceptance of Performance Graded Bituminous Material*. The *NDDOT Procedure for Acceptance of Performance Graded Bituminous Material* is on file at the Materials and Research laboratory.

151.07 SCALES.**Page 88****02-18-00**

Replace the words "Department of Weights and Measures" in the first, second, third, and fourth paragraphs of Section 151.07 A. with the following:

"Weights and Measures Division of the Public Service Commission".

151.07 SCALES.**Page 92****04-23-99**

Delete the first sentence of Section 151.07 C.5.

153.06 ROADBED PLANERS.**Page 101****02-09-01**

Delete the first paragraph of Section 153.06 in its entirety and replace with the following:

The roadbed planer shall be constructed of steel and shall be mounted on tracks. The planer shall be heavy enough to trim the roadbed to the specified tolerance with a frame capable of maintaining the required crown under all operating conditions.

The planer shall be equipped with rotary cutting mechanisms capable of trimming the subgrade and base to the required lines and grades within the tolerances of section 302.04 G.2 Surface tolerance Type B. The equipment shall be capable of trimming in sufficient width in one pass to allow the placement of the 28 foot concrete slab.

201.02 CONSTRUCTION REQUIREMENTS.**Page 111****03-20-98**

Delete the second paragraph in Section 201.02 B. and insert the following:

Trees located within the boundaries of the new grade shall be removed to a depth of 18 inches below the finished ground line or 3 feet below the final dirt grade, whichever is lower. Trees located outside the boundaries of the new grade shall be removed to a depth of 18 inches below the finished ground line. Existing stumps shall be removed to the same depth specified for tree removal.

201.03 METHOD OF MEASUREMENT.**Page 112****03-20-98**

Delete Section 201.03 D.1 and insert the following:

1. The diameter of trees shall be measured at a height of 24 inches above the ground. Payment for Stump Removal shall only be made for removing existing stumps. Stumps shall be measured by the average diameter of the stump at ground level. Trees or stumps 8 inches or less in diameter are classified as brush.

203.02 CONSTRUCTION REQUIREMENTS.**Page 120****08-21-98
09-18-98**

Delete the eighth paragraph in Section 203.02 E.2 in its entirety and insert the following:

After the Contractor has removed the minimum quantity of borrow estimated in the borrow option, the Contractor shall pay the landowner and any other parties with legal interest in the property 80% of the minimum payment within 30 days after the Department has made payment to the Contractor. The balance of the royalty payment shall be paid within 30 days after the Department supplies the Contractor with final quantities. Should the work be performed in more than one calendar year, payment for material removed from the optioned area during a calendar year shall become due on December 31 of that year. If a different payment arrangement is negotiated between the Contractor and the landowner, a copy of the agreement shall be filed with the Department.

203.03 METHOD OF MEASUREMENT.**Page 124****02-19-99**

Delete Section 203.03 C. in its entirety and insert the following:

C. **Borrow.** Borrow will be measured and paid for by the Cubic Yard or Ton according to Section 109.01.

304.02 MATERIALS.**Page 146****11-10-99**

Delete the first and second sentence of the second paragraph of Section 304.02 A. and insert the following:

Each lot of aggregate will be sampled by the Contractor, under the observation of and at random locations determined by the Engineer.

Delete the first sentence of the third paragraph of Section 304.02 A. and insert the following:

Three random samples for each lot, will be obtained by the Contractor, under the observation of and at a location determined by the Engineer.

304.04 CONSTRUCTION REQUIREMENTS.

Page 148

11-10-99

Add the following to the first paragraph in Section 304.04 A.5:

The mechanical spreader shall utilize automatic controls with a stringline to control the longitudinal profile.

304.04 CONSTRUCTION REQUIREMENTS.

Page 149

03-12-99

Delete the last sentence in the third paragraph of Section 304.04 A.6 and insert the following:

If deficient by less than one inch in thickness, price adjustments will be made to the Contract Unit Price for each lot of 4,500 square yards as provided in the following table:

407.02 MATERIALS.

Page 169

09-17-99

Delete the second sentence of Section 407.02 A. and insert the following:

Bitumen will be conditionally accepted at the Project and sampled by the Contractor, according to Department procedures and under the observation of the Engineer.

407.04 CONSTRUCTION REQUIREMENTS.

Page 174

09-18-98

Change the specification designation in the first paragraph of Section 407.04 K.3., from 408.05 C.3.a. to 408.05 C.

408.02 MATERIALS.

Page 179

09-17-99

Delete the second sentence of Section 408.02 A. and insert the following:

Bitumen will be accepted as outlined in the Combined State Binder Group agreement for North Dakota. Samples will be obtained by the Contractor under the observation of the Engineer, and immediately handed over to the Engineer for shipping and testing.

408.04 CONSTRUCTION REQUIREMENTS.

Page 180

02-18-00

Delete the second and third paragraphs in Section 408.04 B. and insert the following:

After 10,000 tons of aggregate is produced, the Contractor shall provide the Engineer with an aggregate sample representing each stockpile for a mix design. A sample tag identifying the project number, pit location, and class of aggregate shall be attached to the sample. The total weight of the combined sample will be about 150 pounds. The Contractor shall also submit in writing the average gradation of each stockpile and the proposed percentage of each stockpile to be used.

If the aggregate blend provided fails to produce the mix design properties recommended in the Field Sampling and Testing Manual, the Engineer and the Contractor will determine if adjustments in aggregate production are necessary to obtain the recommended properties. If it becomes necessary to adjust the aggregate production operation to produce an aggregate that will meet the mix design properties, the Department may negotiate an equitable adjustment with the Contractor. If the Contractor fails to provide a sample representing each stockpile after 10,000 ton of material is produced and the aggregate provided does not produce the desired mix design properties, the Contractor shall be responsible for providing a bituminous mix that meets the mix design properties stated in the Field Sampling and Testing Manual. (This mix must be approved by the NDDOT before production begins.)

The Department will develop a mix design according to the Department's Field Sampling and Testing Manual. The target value for each sieve for the mix design shall be the average of production samples multiplied by the percentage of material used in the blend proportion. NDDOT will blend the aggregate at the blend proportions specified by the contractor. The blended sample will be used for the mix design if the gradations obtained from the blended sample are within the tolerances listed in Table A when compared to the target values determined previously. If the aggregate is not within tolerance a mix design will not be developed. Mix production will not begin until a mix design is developed.

**TABLE A
ACCEPTABLE TOLERANCES**

5/8" – #4 sieve	± 5%
#30 sieve	± 3%
#200 sieve	± 1.5%
Plastic Index	± 2%

408.04 CONSTRUCTION REQUIREMENTS.

Page 182

**02-19-99
02-09-01**

Add the following paragraph after the eighth paragraph in Section 408.04 H.:

- Rumble strips shall be milled into asphalt shoulders and be placed in a continuous pattern. Rumble strips will be discontinued across the full width of all public and private (residential and commercial) road approaches, entrance and exit ramps, and within designated city or urban limits. Rumble strips will not be installed on shoulders less than 4 feet in width.

408.04 CONSTRUCTION REQUIREMENTS.

Page 183

**04-17-98
05-15-98**

Delete the third paragraph in Section 408.04 I.2 and insert the following:

When specified density on mainline is required, the laboratory testing requirements in Section 408.05 C.1 will apply for shoulders, driveways, and section line approaches. The contractor coring and compaction payment schedule in Section 408.05 C.2 and 408.05 C.3 will not apply.

408.04 CONSTRUCTION REQUIREMENTS.

Page 183

02-18-00

Add the following sentence to the end of the sixth paragraph of sections 408.04 I.2:

The Engineer has the option to remove the pneumatic-tired roller if compaction can be achieved without, and there is a problem with the tires picking up or with roller marks in the mat.

408.04 CONSTRUCTION REQUIREMENTS.

Page 184

09-17-99

Delete the third paragraph of Section 408.04 I.3.

408.05 ACCEPTANCE.

Page 185

02-18-00

Delete the fourth paragraph of section 408.05 A. 1. and insert the following:

If any two consecutive tests vary from the JMF gradation target value set for each sieve by more than the tolerances listed below, the pay factor for the full days production will be the lowest pay factor determined from the following formula, unless the daily air voids of the marshall plugs as determined in Section 408.05 C.1 are between 3 and 5% and the aggregate gradation for each sieve is not outside the gradation band for the class of aggregate specified, then the pay factor will be 100%.

408.05 ACCEPTANCE.

Page 189

05-15-98

Delete the third paragraph in Section 408.05 C.2.

408.05 ACCEPTANCE.	Page 190	09-17-99
---------------------------	-----------------	-----------------

Delete Section 408.05 C.3.b. (Control Strip).

408.06 METHOD OF MEASUREMENT.	Page 192	09-17-99
--------------------------------------	-----------------	-----------------

Delete Section 408.06 D. (Control Strip).

408.07 BASIS OF PAYMENT.	Page 192	09-17-99
---------------------------------	-----------------	-----------------

Delete the Pay Item "Control Strip" from Section 408.07.

408.07 BASIS OF PAYMENT.	Page 193	02-19-99
---------------------------------	-----------------	-----------------

Delete Section 408.07 B. in its entirety and insert the following:

When the average of the test results specified in Section 408.05 A.2 shows a larger shale content than the maximum allowable specified, the following deduction from the Bid Price for the bituminous mixture item will be made:

One percent reduction in unit price for each 0.2% above the maximum allowable percentage. If the percentage of shale exceeds the allowable limits by 2% or more, the material will be rejected unless the Construction Engineer elects to accept it under Section 105.07.

This reduction will apply to lots of 10,000 tons, and will be applied independently of Section 408.05 A.1.

420.02 MATERIALS.	Page 195	04-23-99
--------------------------	-----------------	-----------------

Add the following to the end of the paragraph in Section 420.02 A.:

The Field Engineer will determine the actual amount of bitumen to be used based on the chip size.

420.02 MATERIALS.	Page 195	09-17-99 11-10-99
--------------------------	-----------------	------------------------------------

Delete the second sentence of the second paragraph of Section 420.02 A. and insert the following:

The bitumen will be conditionally accepted to the Project and sampled by the Contractor, according to Department's procedures and under observation of the Engineer.

Delete the second sentence of Section 420.02 B. and Section 420.02 C.

420.02 MATERIALS.	Page 195	04-23-99
--------------------------	-----------------	-----------------

Delete the last sentence of Section 420.02 B. and insert the following paragraphs:

A lot is defined as 1,200 tons of material. If plan quantity is less than 1,200 tons, a lot will be equal to plan quantity. If the final lot is less than 600 tons, it will be included in the previous lot, if the final lot is 600 tons or greater it will be a separate lot.

Three random samples will be taken for each lot of material. These samples will be tested and the material accepted if the average of the three samples meets the gradation specified. When the average of the three samples does not meet the gradation specified, a reduction in the Contract Unit Price will be made. If the aggregate fails to meet the specified gradation on one or more sieves, the reduction will be the sum of the deductions. The Unit Price Adjustment will be as calculated below.

Unit Price Reduction: Percent of Deduction = $5 \times$ percent of deviation from range limits.

If the tested material deviates from the specified gradation for two consecutive lots, incorporation of additional material into the work will not be allowed until the Contractor takes the necessary corrective action to meet the specifications.

550.02 MATERIALS.

Page 205

**11-21-97
02-20-98**

Delete Section 550.02 B. in its entirety and insert the following:

B. **Portland Cement Concrete.** Class AE Portland Cement Concrete pavement shall consist of virgin coarse aggregate, virgin fine aggregate, water, an air entrained agent, and Type I, IA, or II Portland Cement.

Material shall meet the requirements of Section 802.

550.02 MATERIALS.

Page 205

09-17-99

Add the following item to the materials list in Section 550.02 C.2:

Backer Rod

826.02 B1

550.04 CONSTRUCTION REQUIREMENTS.

Page 207

02-19-99

Delete the first sentence of the sixth paragraph of Section 550.04 G. 1. and insert the following:

Rumble strips shall be formed in both concrete shoulders at approximately 45 foot spacings.

550.04 CONSTRUCTION REQUIREMENTS.

Page 208

02-18-00

Delete the second and third paragraphs of Section 550.04 H. and insert the following:

The reinforcement shall be positioned on approved supports in advance of the concrete placement or inserted in the plastic concrete by an approved mechanical device.

The Contractor shall verify the placement of reinforcement in the plastic concrete pavement. At minimum, the reinforcement location will be verified at the start of paving each day and at a frequency of every 500 feet during normal paving.

On projects with over 20,000 SY of concrete paving, the location of the reinforcement shall be verified by the use of a micro covermeter. The Contractor shall provide the micro covermeter and, at the request of the Engineer, allow the Department personnel to confirm bar locations with the micro covermeter.

The vertical and horizontal location of the reinforcement in the concrete shall be shown in the plans. If the reinforcement does not meet the requirements and tolerances specified for the placement of the reinforcement, corrective action shall be taken immediately and performed at the contractors expense.

550.04 CONSTRUCTION REQUIREMENTS.

Page 208

07-16-99

Delete the first sentence of 550.04 I.2. and insert the following:

The contraction joints shall consist of weakened planes created by sawing on main line and shoulders, and by either sawing, inserting preformed inserts, or forming grooves in the pavement surface on small areas or tapers.

550.04 CONSTRUCTION REQUIREMENTS.**Page 210****03-12-99**

Add the following sentence to the end of the fifth paragraph of Section 550.04 I.2.:

After the dowel bar assembly is staked to the roadbed and the dowel bars are held firmly in place, the assembly ties running parallel to the dowel bars shall be removed to allow for free movement of the dowel bars.

550.04 CONSTRUCTION REQUIREMENTS.**Page 210****03-12-99**

Delete the last sentence of the sixth paragraph in Section 550.04 I.2. and insert the following:

The release agent shall be applied to the entire length of the dowel bars within two hours of being covered with concrete.

550.04 CONSTRUCTION REQUIREMENTS.**Page 211****11-10-99**

Delete the last sentence of the first paragraph of Section 550.04 I.4 and insert the following:

Transverse construction joints shall be installed halfway between two normally spaced transverse joints.

550.04 CONSTRUCTION REQUIREMENTS.**Page 213****11-20-98**

Delete the fifth sentence in Section 550.04 J.5. in its entirety and insert the following:

Hand floats shall be operated across the pavement by starting at the edge and slowly moving to the crown and back again to the edge.

550.04 CONSTRUCTION REQUIREMENTS.**Page 221****02-18-00**

Delete the first, second and third paragraphs of Section 550.04 Q.4 and insert the following:

4. **Reinforcing Steel Placement.** The tie bars final position shall be within the following tolerances:

Vertical Placement $\pm 1"$

Transverse Placement $\pm 3"$

Delete the last two sentences of the fourth paragraph of Section 550.04 Q.4 and insert the following:

When the average vertical location of the reinforcement is one inch or more outside the specified tolerance or the reinforcement is less than two inches from the top or bottom of the pavement slab, a determination of serviceability will be made according to Section 105.07.

560.04 CONSTRUCTION REQUIREMENTS.**Page 225****04-17-98**

Delete paragraph four in Section 560.04 C. and insert the following:

Before removing the pavement, all bituminous patching material and joint material shall be removed and disposed of by the Contractor at locations acceptable to the Engineer.

602.03 CONSTRUCTION REQUIREMENTS.**Page 248****02-19-99**

Change the title of Section 602.03 H.2. to **Expansion Joints.**

612.03 CONSTRUCTION REQUIREMENTS.**Page 258****05-15-98**

Add the following to the end of the first paragraph in Section 612.03 E.:

If the bars are exposed to ultraviolet rays when storage on the job site or storage yard exceeds, or is expected to exceed, 60 calendar days, the bars shall be covered with opaque polyethylene or other suitable protective material. Provisions shall be made for adequate ventilation to prevent condensation under the covering.

616.03 CONSTRUCTION REQUIREMENTS.**Page 260****06-19-98**

In Section 616.03 B. insert the following before the first paragraph:

Shop inspection personnel shall meet the qualifications stated in the latest ANSI/AASHTO/AWS D1.5 Bridge Welding Code regarding inspection personnel qualifications.

616.03 CONSTRUCTION REQUIREMENTS.**Page 265****09-18-98**

Add the following to the end of the first paragraph in Section 616.03 D.:

Flange-to-web welds and shop welded splices in flanges or webs shall be performed using the automatic submerged arc welding process.

616.03 CONSTRUCTION REQUIREMENTS.**Page 266****04-17-98
07-17-98**

Delete the first two paragraphs in Section 616.03 D.3. and insert the following:

All nondestructive testing (NDT) of welds required by the ANSI/AASHTO/AWS D1.5 95 Bridge Welding Code and by Sections 616.03 D.4 and 616.03 D.5 of the North Dakota Department of Transportation Standard Specifications, shall be the responsibility of the contractor.

Performance of NDT shall be done by trained personnel under the observation of the Engineer. The trained personnel shall have a minimum qualification as an American Society for Nondestructive Testing (ASNT) NDT Level II operator and two-years experience at that level. A written report of all NDT shall be submitted to the Engineer along with material certification documenting compliance of the welds with contract requirements.

The cost of all NDT shall be included in the bid price for "Structural Steel."

704.02 MATERIALS AND EQUIPMENT.**Page 322****09-18-98**

Delete Section 704.02 B. and insert the following:

B. Reflective Sheeting. Orange diamond-shaped, rectangular, and square signs shall be faced with Wide Angle Prismatic Fluorescent Retroreflective Sheeting meeting Section 894.02 G. Barricades and vertical panels shall be Wide Angle Prismatic Retroreflective Sheeting meeting Section 894.02 F. Flexible reflective sheeting, Type III C, shall be used on drums, cones, flexible delineators, and tubular markers. All remaining signs and sign backgrounds shall be faced with Wide Angle Prismatic Retroreflective Sheeting meeting Section 894.02 F.

704.02 MATERIALS AND EQUIPMENT.**Page 323****07-16-99**

Delete the second to the last sentence of Section 704.02 F. and insert the following:

The reflectorized stripes shall be fabricated from Type III C, Type IV or Wide Angle Prismatic flexible reflective sheeting as provided in Section 894.02.

704.02 MATERIALS AND EQUIPMENT.**Page 323****07-16-99**

Add the following sentence to the end of Section 704.02 G.

The reflectorized band shall be fabricated from Type III C, Type IV or Wide Angle Prismatic flexible reflective sheeting as provided in Section 894.02.

704.02 MATERIALS AND EQUIPMENT.**Page 323****09-18-98
07-16-99**

Delete Section 704.02 H. and insert the following:

H. **Tubular Markers and Flexible Delineators.** These devices shall be used to channelize traffic.

1. **Tubular Markers.** Tubular markers shall meet the dimensions, color configuration, and installation details as shown on the Standard Drawings.
2. **Flexible Delineators.** The post shall be tough, resilient PVC in orange color. The post shall have 4-inch wide white bands as shown on the plans. The reflective intensity of the bands shall meet the requirements of Type III C, Type IV, or Wide Angle Prismatic flexible reflective sheeting as provided in Section 894.02

704.02 MATERIALS AND EQUIPMENT.**Page 323****02-09-01**

Delete Section 704.02 K in its entirety and replace with the following:

K. **Portable Barriers.** Precast Concrete Med. Barriers shall meet the details on the Plans or Standard Drawings. Any barriers manufactured after October 1, 2000, must meet the requirements of *NCHRP Report 350*. Continuing use of barriers, purchased and used on previous NDDOT contracts, are approved throughout their useful life.

704.02 MATERIALS AND EQUIPMENT.**Page 324****04-23-99**

Delete Section 704.02 O. in its entirety and insert the following:

Short Term Construction Zone Marking and Short Term Pavement Marking. The short term construction zone marking and the short term pavement marking shall meet Section 762.

704.03 CONSTRUCTION REQUIREMENTS.**Page 325****03-17-00**

Delete the third paragraph of Section 704.03 A. in its entirety and insert the following:

The Contractor is responsible for providing the required traffic control to ensure public and worker safety. If the Contractor has not furnished, installed, located, maintained or removed one or more traffic control devices as required, the Engineer may:

1. Without notification, have the deficiencies corrected by another contractor and deduct the cost of the work from monies due or to become due the Contractor or,
2. Direct work to cease until the deficiencies have been corrected.

704.03 CONSTRUCTION REQUIREMENTS.**Page 325****02-18-00**

Add the following sentence to the end of the fourth paragraph of Section 704.03 A:

Construction sign bases without attached signs shall be marked so they are visible.

704.03 CONSTRUCTION REQUIREMENTS.**Page 326****02-18-00**

Delete the third paragraph of Section 704.03 C. in its entirety and insert the following:

Portable signs shall be used when construction operations in an area are temporary. Temporary operations are those that can generally be completed in 5 days or less. If unforeseen circumstances occur, such as equipment breakdown, rain, subgrade failures, etc., time will not accrue towards the 5 day period.

When portable signs are used, they shall be placed on the shoulder or outside of the traveled lane where they do not pose a hazard to traffic. The portable signs shall be placed in clear view without any sight obstructions to oncoming traffic. When portable signs are not in use, they shall be removed, moved to a minimum of 45 feet from the edge of the traveled lane, or laid down on the inslope. Signs laid on the inslope shall have stand bases constructed so the signs and bases can be placed flat with no portions of the sign or base projecting upward from the inslope more than 6 inches.

704.03 CONSTRUCTION REQUIREMENTS.**Page 327****09-18-98**

Delete Section 704.03 M. and insert the following:

M. **Flexible Delineator Application.** Flexible delineators used to channelize traffic and separate 2-way traffic shall be located and attached as shown in the Plans. The contractor shall maintain the delineators until they are removed. The delineators shall be removed as soon as the new roadway is opened to traffic and shall remain the property of the contractor.

If flexible stake delineators are used, the wide side shall face the traffic. If the delineator is to be seen by side traffic, an additional delineator shall have the wide side placed facing the side traffic. The side traffic delineators shall not be paid for, but shall be incidental to the price bid for "Flexible Delineators."

704.03 CONSTRUCTION REQUIREMENTS.**Page 329****04-23-99**

Delete the word "temporary" in the first, second, and third sentences of 704.03 T. and insert "short term".

704.03 CONSTRUCTION REQUIREMENTS.**Page 330****04-17-98**

Delete Section 704.03 U.1.b.2 in its entirety and insert the following:

- (2) Be on site daily to supervise the installation, operation, inspection, maintenance, and removal of the traffic control system.

704.03 CONSTRUCTION REQUIREMENTS.**Page 330****04-17-98
05-15-98**

Delete the first paragraph of Section 704.03 U.2 in its entirety and insert the following:

2. **Watchpersons.** Watchpersons shall be provided to patrol the project to assure that the traffic control devices are properly placed in accordance with the traffic control plans and standards. The project shall be patrolled at least twice daily, once in the morning prior to work beginning and once in the evening after work is completed. The project shall also be patrolled twice daily on weekends and days when no work is in progress, once each morning and once each evening before sunset.

704.03 CONSTRUCTION REQUIREMENTS.**Page 332****10-20-00
02-09-01**

Delete the second paragraph of Section 704.03 X in its entirety and replace with the following:

Each flagger shall be furnished with the booklet, "Flagging Handbook," and shall observe the rules and regulations contained therein. The Contractor shall obtain copies of the "Flagging Handbook" from the Department.

704.04 METHOD OF MEASUREMENT.**Page 333****09-18-98**

Add the following to Section 704.04 A.2.:

h. Tubular Markers

704.05 BASIS OF PAYMENT.**Page 334****09-18-98
02-09-01**

Add the following pay item to Section 704.05 A.:

Pay Item

Tubular Markers

Precast Concrete Med Barrier

Pay Unit

Each

Each

708.02 SEEDING, SODDING, AND MULCHING.**Page 344****07-17-98**

Delete the first sentence in Section 708.02 C.1.c.(4) and insert the following:

This seeding type includes placing approved topsoil from borrow areas to form a seed bed.

708.02 SEEDING, SODDING, AND MULCHING.**Page 349****04-17-98**

Add the following to the beginning of Section 708.02 E.:

Should the quantity of seeding, sodding, or mulching which is part of an approved subcontract decrease by more than 25%, the Contractor may submit a request for an adjustment of the Contract Unit Price. The adjustment in unit price will only be considered if it justifies an increase in the pro rata share of the fixed costs chargeable to the item because of the decreased quantity. The total payment for the final quantity shall not exceed 75% of the original contract quantity at the Contract Unit Price.

Should the quantity of seeding, sodding, or mulching which is part of an approved subcontract increase by more than 25% from the original contract quantity either party to the contract may submit a request for an adjustment of the Contract Unit Price for the quantity in excess of 125% of the original contract quantity.

The Contractor shall provide a notice of intent to request an adjustment in the Contract Unit Price as soon as the Contractor is aware of overruns or underruns. All adjustments in unit price will be determined according to Section 104.03 B.2. if requested by the Department, the Contractor shall furnish the bid documents used to calculate the Contract Unit Price. Failure to submit the bid documents will result in the Contractor waiving all rights to an adjustment in the Contract Unit Price.

709.03 CONSTRUCTION REQUIREMENTS.**Page 356****09-18-98
02-18-00**

Delete the second paragraph in Section 709.03 A. and insert the following:

The fabric shall be overlapped a minimum of 18 inches at all splices or joints. In lieu of joint overlapping, multiple fabric pieces may be sewed if the seam strength meets the seam strength requirements listed in Section 858.01 A. A 401 stitch conforming to Federal Standard No. 751a shall be used for all seams. Overlapping "J" seams are required for field seams. All seams shall be sewn with two parallel stitch lines spaced approximately 1/4 inch apart. The outside stitch shall be placed approximately one inch from the edge of the fabric. The thread shall be of a material that meets the requirements specified for the fabric.

If sewn seams are going to be used, the contractor shall also furnish a sewn seam sample, using the same geotextile fabric, thread, seam spacing and number, and overlap distance as are intended or required for use in the work.

709.03 CONSTRUCTION REQUIREMENTS.**Page 356****11-10-99
02-18-00**

Add the following paragraphs after the second paragraph of Section 709.03 A:

The geotextile fabric and a certification of compliance shall be delivered to the project at least 21 days prior to its incorporation into the work. Fabric shall be approved by the Engineer before installation.

If a fabric is tested and fails, any retests will be at the cost of the Contractor, unless the results of the retest show the fabric passes.

If the Engineer allows installation and the fabric fails to meet the specified requirements a minimum price adjustment of 20% will be assessed to the bid price for any fabric installed. Actual penalties will be determined by the Engineer, based on projected performance of fabric. If the failing fabric jeopardizes the integrity of the project, the fabric will be removed and replaced at the Contractor's expense.

709.03 CONSTRUCTION REQUIREMENTS.**Page 358****06-19-98**

Add the following to Section 709.03:

F. Shipping and Storage.

Geotextile labelling and identification shall comply to ASTM D 4873–95. If a label is removed during sampling or other reasons, the roll must be relabeled.

Packaging, handling, and storage of geosynthetics shall conform to ASTM D 4873-95 and the following requirements. Each Geotextile roll shall be wrapped with a waterproof cover or membrane for protection during shipping and storage. Geotextiles shall not be exposed to ultraviolet light for more than 14 days and shall be elevated off the ground during storage.

709.03 CONSTRUCTION REQUIREMENTS.**Page 357****11-21-97**

Delete the first paragraph of Section 709.03 D. in its entirety and insert the following:

If more than one length or width of fabric is necessary, all joints shall be overlapped or sewn as required in Section 709.03 A.

When the fabric is used for scour or stream bank protection it shall be placed loosely and be unrolled in the direction of the anticipated water flow. If the fabric is overlapped, the overlap shall be placed so the upstream strip laps over the downstream strip. The laps along the length of the fabric, parallel to the waters edge, shall be placed so the upper strip overlaps the lower strip. All overlaps shall be pinned or stapled at three-foot intervals.

Fabric used to protect against wave action may be unrolled parallel or perpendicular to the waters edge. The joints or seams of all fabric placed parallel to the waters edge shall be sewn.

709.03 CONSTRUCTION REQUIREMENTS.**Page 358****09-18-98**

Delete the second and third sentences in the second paragraph of Section 709.03 E.

714.02 MATERIALS.**Page 361****02-19-99
03-12-99**

Delete the item; Perforated, Corrugated Polyethylene, or Plastic Pipe. 830.03 A.5 in Section 714.02 C. and insert the following:

Item

Perforated, Corrugated Polyethylene, or Plastic Pipe.

Section

830.03 A.4.

714.02 MATERIALS.**Page 361****02-19-99
03-12-99**

Delete the items; Perforated, Corrugated P.E. Pipe., 830.03 A.5, and PVC Discharge Pipe, 830.03 A.4, in Section 714.02 E. and insert the following:

Item

Perforated, Corrugated P.E. Pipe
PVC Discharge Pipe

Section

830.03 A.4.
830.03 A.3

714.03 CONSTRUCTION REQUIREMENTS.**Page 363****02-18-00**

Add the following to the end of Section 714.03 A.:

9. Corrugated Polyethylene (plastic) Pipe shall be installed as shown on Standard Drawing D-714-14. A minimum of thirty days after the pipe is installed, the Contractor (under the observation of the engineer) shall pass a mandrel or other approved object through the pipe to check for deformation. The mandrel diameter shall not be less than 95% of the inside diameter of the pipe. If the plastic pipe has deformed more than 5%, it shall be replaced at the Contractors expense. Another thirty day waiting period will commence upon installation of the replacement pipe.

714.03 CONSTRUCTION REQUIREMENTS.**Page 363****05-21-99**

Delete the Fourth sentence of the second paragraph of 714.03C., and insert the following:

The underdrain shall rest on the filter fabric at the bottom of the trench, at the desired grade, prior to backfilling with the granular fill. No more than 1" of granular material may be used to adjust the pipe to grade.

714.04 METHOD OF MEASUREMENT.**Page 365****02-20-98**

Delete the first paragraph of Section 714.04 E. in its entirety and insert the following:

- E. **Edge Drains.** Edge drains shall be measured by the Linear Foot (parallel to the roadway) of "Edge Drain Permeable Base" or "Edge Drain Non-Permeable Base" installed and accepted by the Engineer. No deduction in length will be made for outlet structures installed along the drain. The Contract Unit Price bid shall include all costs for trenching, geotextile fabric, trench backfill, compaction, caps, manhole connections, and other associated work.

740.03 CONSTRUCTION REQUIREMENTS.**Page 376****10-20-00**

Move the second, third, fourth, and fifth paragraphs of Section C. to section D.

754.03 CONSTRUCTION REQUIREMENTS.**Page 387****10-20-00**

Delete the first paragraph of Section 754.03 B.2 in its entirety and replace with the following:

2. **Fabrication of Sign Backing.** Sign backing shall be cut to size and shape and shall be free of buckles, warps, dents, cockles, burrs, and all defects resulting from fabrication. Signs that are larger than manufacturer's material shall be fabricated in sections with butt joints vertical. The sections shall have a minimum width of 24 inches. If more than two sections of backing are required, the wide sections shall be placed on the outside positions and the narrower one placed in between. The widest manufacturer's sections of aluminum shall be used before narrower sections are used. The surface of all signs shall be plane surfaces.

Delete the third paragraph of Section 754.03 B.4 in its entirety and replace with the following:

The reflective sheeting used on flat sheet sign backings larger than the manufacturer's material shall have reflective sheeting placed on each section with no vertical or horizontal splicing of the reflective material on the individual panels. All sheeting on each individual sign shall be from the same manufacturer's lot.

Delete the fourth and fifth paragraphs of Section 754.03 B.4 in their entirety.

754.03 CONSTRUCTION REQUIREMENTS.**Page 390****02-20-98**

Delete Section 754.03 E.4 in its entirety and insert the following:

4. **Single Tubular Sign Supports.** When a single sign support is required, a Single Tubular Sign Support shall be used. Single Tubular Sign Supports shall be set in a Class AE Portland Cement Concrete base,

constructed as shown on the Plans. Breakaway base plates shall be assembled with the bolts torqued to Plan requirements. The plates shall be carefully placed so the tapered bolt slot tapers toward approaching traffic. Either the stub post or the anchor bolt design may be used as detailed. If the anchor bolt design is used, a Portland Cement Grout shall be used to raise the top of the foundation to a snug fit under the base plate.

754.04 METHOD OF MEASUREMENT.

Page 396

04-14-00

Delete the second paragraph of Section 754.04 B.1 and insert the following:

The post length shall be measured from the top of the post to bottom of post and top of anchor to the bottom of the anchor, as shown on the plans. The sleeves and break away base, if included, will not be measured for payment, but will be considered incidental to the cost of the post.

754.05 BASIS OF PAYMENT.

Page 397

02-20-98

10-20-00

Delete the item "Galvanized Steel Post (two or more)" and "Reset Signs" from the pay item list and insert the following:

Pay Item	Pay Unit
Reset Sign Panels	Each
____"Galvanized Steel Post – W-Shaped (two or more)	Linear Foot

762.02 MATERIALS.

Page 398

02-20-98

04-23-99

Delete item "Temporary Stripe" and "Preformed Plastic Marking Film" from the materials list and insert the following:

Item	Section
Short-Term Pavement Marking	
Paint	880.08
Tape	880.08

762.03 EQUIPMENT.

Page 398

04-17-98

06-19-98

Add the following to Section 762.03

Grooving Equipment. The grooving equipment shall utilize diamond blades mounted on a self propelled machine designed for grinding a recess into the pavement surface. The diamond blades shall be gang mounted on a floating head with controls capable of providing uniform depth and alignment. The grooving equipment shall be capable of grooving a total width sufficient to install 4-inch wide pavement marking tape in a single pass. The equipment shall not cause strain or damage to the underlying surface of the pavement. Grooving equipment that causes ravels, aggregate fractures, spalling, or disturbance of the joints shall not be permitted.

762.04 CONSTRUCTION REQUIREMENTS.

Page 399

04-17-98

06-19-98

Add the following to Section 762.04 B

6. Grooved Pavement Markings. When specified in the plans, the pavement surface shall be grooved to make a recess in the pavement surface for the pavement marking film. The groove shall meet the following tolerances:

Depth	40 mils ±5 mils
Width	line width plus 1/2 inch
Length	line length plus 3 inches
	per end of line
Line End Tapers	3 inches

For messages, the area grooved shall be the same area as the messages. Grooving a rectangular area to contain the message will not be allowed. Grooving shall meet the depth requirements specified above.

After grinding, the grooved slot shall be blown clean to remove any residue and loose materials prior to the installation of the pavement marking. When wet-grinding, the grooved slot shall immediately be pressure washed to remove residue. If necessary, the grooved slot shall be blown clean just ahead of the pavement marking installation. The pavement markings shall be installed on a clean dry surface within 24 hours of the initial grinding. If pavement marking installation does not occur within 24 hours of the initial grinding, the groove shall be sandblasted and blown clean to remove any dirt, oil, loose material, or other contaminate prior to the installation of the pavement marking.

The pavement marking film shall be installed as specified in Section 762.04 D.

762.04 CONSTRUCTION REQUIREMENTS.**Page 400****04-14-00**

Delete Section 762.04 C.2 in its entirety and insert the following:

2. Traffic Movement. Traffic shall be maintained through the work area at all times according to the traffic control plan and Section 704. Flagpersons shall be furnished when required.

PROTECTION VEHICLE WITH TRUCK MOUNTED ATTENUATION DEVICE (TMA):

A protection (shadow) vehicle with a truck mounted attenuation device shall be provided by the contractor to protect personnel and equipment from damage during mobile operations. The protection (shadow) vehicle will not be required on construction projects when the advance warning signs are in place.

Truck-mounted attenuation device shall meet the test requirements of (NCHRP) Report 350 test level TL-3.

The protection vehicle equipped with the TMA shall have a minimum weight of 10,000 pounds or the minimum weight recommended by the manufacturer of the TMA.

The protection vehicle shall be equipped with seat and shoulder belts along with a head cushion.

The protection vehicle shall have an advance warning flashing or sequencing arrow panel conforming to NDDOT Specification 704.02M.

The positioning of the protection vehicle with the TMA in relation to construction activities will be as shown in the plans.

The cost of furnishing the protection vehicle with the TMA shall not be bid separately, but shall be included in the price bid for the item "Pavement Markings."

762.04 CONSTRUCTION REQUIREMENTS.**Page 401****04-17-98**

After the first paragraph in Section 762.04 D.1.d. add the following:

On the final lift, new asphalt pavements shall be allowed to cool to a maximum temperature of 125°F. before applying short-term pavement marking paint.

762.05 METHOD OF MEASUREMENT.**Page 404****04-17-98
06-19-98**

Add the following to Section 762.05:

F. Grooved Pavement Markings.

1. **Preformed Patterned Pavement Marking – ___ inch line (Grooved).** Preformed Patterned Pavement Marking – ___ inch line (Grooved) will be measured by the linear foot of the various widths of line installed and accepted by the Engineer.
2. **Preformed Patterned Pavement Marking – Message (Grooved).** Preformed Patterned Pavement Marking —Message (Grooved) will be measured by the square footage of pavement marking message installed and accepted by the Engineer.

762.06 BASIS OF PAYMENT.**Page 405****04-17-98
05-15-98**

Add the following Pay Items and Pay Units to 762.06:

Pay Item	Pay Unit
Preformed Patterned Pavement Marking – __ inch line (Grooved)	Linear Foot
Preformed Patterned Pavement Marking – Message (Grooved)	Square Foot

764.03 CONSTRUCTION REQUIREMENTS.**Page 408****11-20-98
09-17-99**

Add the following paragraph to Section 764.03 C:

A manufacturer's representative shall be available, on an as need basis, for the installation of the guardrail end treatments. The contractor shall furnish 3 copies of the installation instructions and drawings of the guardrail end terminals to the District Engineer. One copy is for the Project Engineer, 1 copy is for the District Engineer, and 1 copy is for the Traffic Control Engineer. The detailed drawings shall contain all components of the end treatment assembly.

764.03 CONSTRUCTION REQUIREMENTS.**Page 409****02-18-00**

Add the following Section as Section 764.03 I.:

- I. **Attenuating Crash Cushions:** The attenuating crash cushion shall be installed in the locations shown on the plans. The attenuating crash cushion shall consist of energy-absorbing material surrounded by a framework of steel, panels, and a nose cover fabricated from plastic or other material with a yellow color. The unit shall be able to withstand the environment extremes in the state of North Dakota and operate as specified in this environment.

The units shall have been crash tested in accordance with NCHRP Report 350, Test Level 2 or 3, and approved by the FHWA in writing. The FHWA approval letter shall be provided to the Construction Office with the attenuating crash cushion shop drawings.

The nominal width of the system shall be as shown on the plans. The unit shall be installed in accordance with the manufacturer's recommendation. A Class AAE-3 reinforced concrete slab shall be constructed for each unit as shown in the plans. All anchorage requirements for the unit to concrete slab shall be installed in accordance with the manufacturer's recommendations. Transition panels shall be installed from the unit to the barrier end or transition as shown on the plans. The contractor shall furnish shop drawings for approval for the attenuating crash cushion. The shop drawings shall include manufacturer's specifications, erection instructions, maintenance instructions, and the FHWA approval letter.

764.04 METHOD OF MEASUREMENT.**Page 409****11-20-98**

Add the following as Section 764.04 G:

- G. **W-Beam Guardrail End Terminal.** W-Beam Guardrail End Terminals will be measured by the unit for each unit installed and accepted by the Engineer.
-

764.04 METHOD OF MEASUREMENT.**Page 409****02-18-00**

Add the following Section as Section 764.04 H.

- H. **Attenuating Crash Cushion.** Measurement will be by the number of complete units installed and accepted by the Engineer.
-

764.05 BASIS OF PAYMENT.**Page 410****11-20-98**

Add the following pay item to Section 764.05:

Pay Item

W-Beam Guardrail End Terminal

Pay Unit

Each

764.05 BASIS OF PAYMENT.**Page 410****02-18-00**

Add the following Pay Item to Section 764.05:

Pay Item

Attenuating Crash Cushion

Pay Unit

Each

772.02 MATERIALS.**Page 20, Vol. 2****02-09-01**

Add the following to Section 772.02 C:

The Contractor shall provide a certification that all components of the LED signal modules meet the Institute of Transportation Engineers Standards.

772.03 CONSTRUCTION REQUIREMENTS.**Page 22, Vol. 2****07-16-99**

Add the following to Section 772.03 D.3:

- d. Microloop Probe set shall consist of furnishing and installing the microloop probes at the locations shown in the plans.
- e. Preformed Loop Detector shall be securely tied down to prevent the loop from floating during placing of concrete. The pull box end or the conduit shall be sealed to protect against water entrenchment.

772.04 METHOD OF MEASUREMENT.**Page 31, Vol. 2****07-16-99**

Add the following items to Section 772.04 B.:

- 16. **Microloop probe.** Microloop (single, double or triple) probes shall be measured by the number of single, double or triple probe sets installed. This item shall include the trench, drilling holes, sand, conduits, saw slot, length of conductor from pull box including additional quantities required in section 772.03 D. 4, and testing loops.
- 17. **Preformed Loop Detector.** Preformed Loop Detectors will be measured as a unit. This item shall include the conduit and length of conductor including additional quantities required in section 772.03 D.4.

772.05 BASIS OF PAYMENT.**Page 32, Vol. 2****07-16-99**

Add the following pay items to Section 772.05:

Pay Item

Microloop (Single) probe
Microloop (Double) probe set
Microloop (Triple) probe set
Performed Loop Detector

Pay Unit

Each
Each
Each
Each

802.01 DESCRIPTION.**Page 428****02-20-98**

Delete the first sentence in the first paragraph of Section 802.01 B.3 and insert the following:

Section 816.02 A. divides coarse aggregate into three size numbers based on gradation.

802.01 DESCRIPTION.**Page 429****02-09-01**

Delete the first paragraph of Section 802.01 C6 in its entirety and replace with the following:

■ Fly ash replacement of cement is allowed on a 1:1 ratio, up to a maximum of 30%.

806.02 EPOXY RESIN ADHESIVES.**Page 435****02-19-99**

Delete Section 806.02 in its entirety and insert the following:

This material shall meet AASHTO M-235 Type IV Grade III.

816.03 AGGREGATES FOR SURFACING, BASE, ASPHALT MIXES, BLOTTER, AND SEAL COATS.**Page 441****03-20-98****02-19-99****11-10-99****02-18-00**

Delete Table II in Section 816.03 B. and insert the following:

Table II: Aggregates for Asphalt Mixes, Blotter, and Seal Coats

Sieve Size Percent Passing	Asphalt Hot Mix Low to High Quality				Chip Seal	Chip Seal	Blotter Sand	Sand Seal
	27	29	31	33	42	43	44	45
3"								
1-1/2"								
1-1/4"								
1"								
3/4"								
5/8"	100	100	100	100			100	
1/2"	70-100	70-100	70-100	70-100				
3/8"					100	100		100
No. 4	40-70	40-70	40-70	40-70	20-70	20-70	90-100	85-100
No. 8					2-20	0-17		
No. 16								45-80
No. 30	15-35	15-35	15-35	15-35				
No. 50								10-30
No. 200	2.0-9.0	2.0-9.0	2.0-9.0	2.0-9.0	0-5	0-2	0-20	0-3
Shale ¹	5.0%	5.0%	5.0%	5.0%	8.0%	8.0%		3.0%
L.A. Abrasion ¹	40%	40%	40%	40%	40%	40%		
Plasticity Index ²	3	3	N.P.	N.P.				
Fractured Faces ³	55%	65%	75%	95%				
Crushed Fines ⁴	10%	40%	60%	80%				

Footnotes for Tables I and II:

¹ Maximum Allowable Percentages.

² Maximum allowable unless range shown. N.P. = Non Plastic as per AASHTO T-90. Use material passing the No. 40 sieve (standard method). For Class 5 aggregate the maximum allowable Plasticity Index shall be determined from the following formula: Max. allowable PI for Class 5 = 10 - (% Passing No. 40 Sieve / 10)

³ Minimum weight percentage allowable for the portion of the aggregate retained on a No. 4 sieve having at least 1 fractured face for Classes 4, 5, 13, 27, 29, 31, and 33, and at least 2 fractured faces for Class 7.

⁴ Minimum percentage of material passing a No. 4 sieve that is composed of fractured material produced by a crushing process. The Contractor shall demonstrate that the crushing operation produces this result.

816.03 AGGREGATE FOR SURFACING, BASE, ASPHALT MIXES, BLOTTER, AND SEAL COATS.**Page 442****11-21-97**

Delete the first footnote in Section 816.03 C. and insert the following:

* Oven-dry weights will be substituted for saturated surface-dry weights. The No. 30 sieve will be substituted for the No. 50 sieve. The percentage of lightweight pieces will be based on the total sample retained on the No. 30 sieve. Lightweight pieces will be those with a specific gravity less than 1.95. Agitate the sample by stirring for a period of 15 seconds. Allow the sample to settle for 30 seconds and decant. Perform this procedure until the specimen is free of floating pieces or a maximum of three times.

818.02 SPECIFIC REQUIREMENTS.**Page 443****09-18-98**

Add the following to Section 818.02 A.:

3. Performance Graded (PG) Asphalt Cement AASHTO MP1*

* Testing Tolerances will be allowed according to Table 1 of the *NDDOT Procedure for Acceptance of Performance Graded Bituminous Material*. The *NDDOT Procedure for Acceptance of Performance Graded Bituminous Material* is on file at the Materials and Research laboratory.

818.02 SPECIFIC REQUIREMENTS.**Page 445****03-21-99**

Delete the reference "ASTM D977," in Section 818.02 E. and insert the following reference:

E Anionic Emulsified Asphalt AASHTO M-140

818.02 SPECIFIC REQUIREMENTS.**Page 446****06-18-99**

Delete the table in Section 818.02 E. (notes following the table will remain) and insert the following table:

Property	ASTM Test	HFMS-2	HFRS 2P	HFRS-2
Viscosity, Sabolt Furol @ 122°F. (50 °C)	Note #1	35-150	50-200	50-200
Sieve Test, Retained on #20, max. %	Note #1	0.1	0.1	0.1
Storage Stability, 24 hour, max. %	Note #1	1.0	1.0	1.0
Asphalt Residue by Distillation, min. %	Note #2	62	65	63
Oil Portion of Distillate by volume, max. %	D-244	3.0	3.0	3.0
Float Test @ 140°F., Seconds, min.	Note #3	1200	1200	1200
Solubility in Trichlorethylene, min. %	D-4	97.5	97.5	97.5
Penetration, 77°F., 100 gm, 5 sec.	D-5	140-225	140-225	140-225
Apparent Viscosity @ 140°F.	D-4957	Note #4		Note #4
Demulsibility, 0.02 N CaCl ₂ , min. %	D-244		40	40
Demulsibility, 0.1 N CaCl ₂ , min. %		30		
Ductility, 77°F., 5 cm/min., cm, min.	AASHTO T-51		75	40
Elastic Recovery, 77°F., min. %	Note #5		58	

820.01 GENERAL.**Page 448****04-23-99**

Delete the first full paragraph in Section 820.01 in its entirety and insert the following:

The requirement for loss on ignition in AASHTO M-295 (table 1 chemical requirements) is modified from 5.0% to 2.0% max. Also the optional requirements in Table 1A are required.

Fly ash shall be from an electrical generating plant using a single coal source. Fly ash produced at plants where the limestone injection process is used for controlling air pollutants will be considered unacceptable for use in Portland Cement Concrete. The Contractor shall provide weather-tight storage facilities for the fly ash either at the source or on the Project site.

826.02 MATERIALS.**Page 452****02-19-99****03-12-99****05-21-99****06-18-99**

Delete Sections 826.02 A.1., 826.02 A.3., and 826.02 A.4. in their entirety and insert the following:

A Hot Applied Joint Sealant.**1. Type 1 Crumb-Rubber Joint Sealant.**

The joint sealant material shall be a single component, hot-poured sealant meeting the requirements of AASHTO M-173 and shall have a minimum softening point of 190°F. (88°C.), as determined by ASTM D 36. The sealant shall resist softening and pickup by vehicle tires in the summer and cracking in the winter when used in this application. Plasticizers and fillers may be added as necessary to meet the requirements specified.

The sealant shall consist of a blend of asphalt cement and vulcanized granulated crumb tire rubber. The asphalt cement shall meet the requirements of AASHTO M-20 or M-226. The minimum percentage of crumb tire rubber added shall be 12% of the total weight of the sealant-rubber mixture.

The granulated crumb tire rubber shall be free of fabric, wire, cord, and other foreign material. Calcium carbonate may be added at a rate not to exceed 4% of the total weight of the crumb rubber to prevent the rubber particles from sticking together. The granulated crumb rubber shall meet the following requirements:

a. **Gradation.**

Sieve Size	Percent Passing
#8	100
#10	95 – 100
#30	0 – 20
#50	0 – 5

b. Specific Gravity of 1.15 ± 0.02

Acceptance. Joint Sealants that meet the quality requirements specified will be accepted at the contract unit price. Sealants that fail to meet the requirements specified but the quality deviation is not serious enough to materially affect the work quality will be paid for as follow:

Price Reduction Criteria. Reduce payment for the crumb rubber joint sealer by 20 percent if the Bond or Flow fails.

The payment for Penetration is reduced by the following schedule. Use the average of the original and check sample to determine the percentage of variation.

Variation of Penetration	Deduct Factor
0.1–5%	5%
5.1–10%	10%
10.1–15%	15%
> 15%	20%

The payment for Softening Point is reduced by the following schedule. Use the average of the original and check sample to determine the temperature variation.

Temperature Variation (Degrees C)	Deduct Factor
85–87.9	5%
80–84.9	10%
< 80	20%

826.02 MATERIALS.

Page 452

**03-20-98
05-21-99**

Change the Penetration at 77°F. requirement in Section 826.02 A.2. from 90–150 to 120–150.

Insert the following:

Acceptance. Joint Sealants that meet the quality requirements specified will be accepted at the contract unit price. Sealants that fail to meet the requirements specified but the quality deviation is not serious enough to materially affect the work quality will be paid for as follow:

Price Reduction Criteria. Reduce payment for the crack sealer by 20 percent if the Bond or Flow fails.

The payment for Penetration is reduced by the following schedule. Use the average of the original and check sample to determine the percentage of variation.

Variation of Penetration	Deduct Factor
0.1–5%	5%
5.1–10%	10%
10.1–15%	15%
> 15%	20%

826.02 MATERIALS.

Page 454

09-17-99

Delete the last paragraph of Section 826.02 B.1. and insert the following:

Backer rod shall be a "Type 1" rod material intended for use with cold-applied sealants in accordance with ASTM D 5249 – 95. The width of the backer rod shall be as recommended by the manufacturer for the required saw cut width. No bond or reaction shall occur between the rod and the sealant.

836.04 DOWEL BARS AND TIE BARS FOR PAVEMENT JOINTS.**Page 463****06-18-99****07-16-99****09-17-99**

Delete the third and last paragraph of Section 836.04, and insert the following:

All dowels shall be Epoxy coated in accordance with AASHTO M 284/M 284M-95. Freshly exposed steel as a result of shearing, saw-cutting, or cutting by other means during the fabrication process is acceptable on the ends of tie or dowel bars used in pavement joints.

Tie bars for the centerline joint in Portland Cement Concrete pavement shall be epoxy coated, meeting the requirements in 836.02 B. Other tie bars not used for the centerline joint shall meet AASHTO M-31, Grade 40 deformed.

858.01 GENERAL.**Page 469****09-18-98**

Add the following rows to the table in Section 858.01 A.:

Geotextile Property	Test Method	GEOTEXTILE FABRIC TYPE								
		Separation ⁽²⁾		Drains				Riprap	Reinforcement	
		S1	S2	D1	D2	D3 ⁽³⁾	D4 ⁽³⁾	RR	R1	R2 ⁽⁴⁾
Sewn-Seam Strength, lbs.	ASTM D-4632	160	160	160	70	90	N/A	180	N/A	–
Sewn-Seam Strength, lbs./in.	ASTM D-4884	N/A	N/A	N/A	N/A	N/A	N/A	N/A	240	–

Change the Geotextile Property "Ultraviolet Degradation % min. @ 150 Hrs., min." in the table in Section 858.01 to:

U.V. Resistance
(After 150 hours)
% strength retained

860.03 STEEL POSTS.**Page 470****05-15-98**

Delete Section 860.03 A. and insert the following:

A. **Line Posts.** Line posts shall meet the details shown on the Plans and the following requirements:

Posts shall be galvanized and meet ASTM A-702, type B steel.

Wire fasteners shall be furnished with each post. They shall be made of galvanized wire and shall securely fasten the wire to the posts.

Each post shall have rolled in corrugations, ribs, lugs or notches so constructed as to engage the fence wires in proper position. Posts with punched tabs intended to be crimped around the wires shall not be accepted.

**862.03 GUARDRAIL UNITS AND FITTINGS
FOR W-BEAM GUARDRAIL.****Page 473****11-20-98**

Add the following as Section 862.03 E:

E. **W-Beam Guardrail End Treatments.** W- beam Guardrail End Treatments shall meet the requirements of the National Cooperative Highway Research Program (NCHRP) Report 350, Test Level 3.

The impact head shall be capable of flattening, cutting, kinking or bending the guardrail away from the impacting vehicle. The impact head shall be attached to the first post by two 3/8 inch lag screws as specified by the supplier. The first post and second post shall be installed in a galvanized steel foundation tube. A breakaway cable assembly shall be anchored to the guardrail as shown in the plans. The remaining posts shall be break away posts and standard line posts as shown in the plans. The guardrail elements shall be of the lengths shown on the plans and be 12 gage sections as specified in AASHTO M-180. The timber posts shall meet requirements for materials that passed the crash testing.

880.01 PAVEMENT MARKING PAINT.

Page 475

06-19-98

Delete the third sentence in Section 880.01 A.2. and replace it with:

Paint shall be packaged in a container coated with a non-corrosive lining.

880.01 PAVEMENT MARKING PAINT.

Page 475

05-15-98

Delete the fourth sentence in Section 880.01 A.2 and insert the following:

The outside coating, for drums containing water based paints, shall be a pastel color.

880.01 PAVEMENT MARKING PAINT.

Page 476

04-14-00

Delete Section 880.01 B. in its entirety and insert the following:

B. Specific Requirements for Solvent Based Traffic Marking Paint. Solvent based pavement marking paint shall meet the general requirements of AASHTO M-248-86: "Ready Mixed White and Yellow Traffic Paints" except for the following requirements:

AASHTO M-248-86, Section 4.1.2 shall be revised as follows:

ASTM D476 Type I Anatase, or Type II Rutile shall be used.

AASHTO M-248-86, Section 5.2.1, Extracted Pigment Requirements, shall be revised as follows:

The minimum purity requirements for the respective materials shall be as given in Sections 4.1.1 through 4.1.5.

**Composition of Solvent Based Paint
White Traffic Paint**

Pigment Ingredients (% of Pigment)	Low VOC Type F
Titanium Dioxide, Min.(Pure)	17.5
Calcium Carbonate	35.0-40.0
Magnesium Silicate	35.0-43.0
Zinc Oxide, Min.	3.0

**Composition of Solvent Based Paint
Yellow Traffic Paint**

Pigment Ingredients (% of Pigment)	Low VOC Type F
Lead Chromate, Min. (Pure)	16.7
Calcium Carbonate	35.0-40.0
Magnesium Silicate	35.0-43.0

AASHTO M-248-86, Section 5.3 shall be revised as follows:

**Composition of Non-Volatile Vehicle
White and Yellow Traffic Paint**

Vehicle Ingredients (% by Wt. of Vehicle)	Acrylic Copolymer Type F	Chlorinated Rubber Type F
Alkyd Resin Solids (±0.5%)	41.14	37.6
Acrylic Copolymer BR-201 or equivalent (±0.5%)	47.25	—
Chlorinated Rubber (±0.5%)	—	37.0
Chlorinated Paraffin (±0.5%)	11.61	25.4

AASHTO M-248-86, Section 5.4 shall be revised as follows:

Quantitative Requirements of White Solvent Based Paint

Characteristics	Low VOC Type F
Titanium Dioxide (as % of Extr. Pigment) (min) (Pure)	17.5
Pigment (%)	49.0–51.0
Total Solids (%) (min)	69.0
Vehicle Solids (%) (min)	38.0
Weight per Gallon (lbs) (min)	11.1
Viscosity (K.U.)	70–85
Fineness of Grind (Hegman) (min)	2.0
Drying Time (Minutes) (max)	10.0
Directional Reflectance, (%) (min)	80
Uncombined Water (%) (max)	1.0
Particles and Skins Retained on 325 Mesh Sieve (%) (max)	1.0
Volatile Organic Content (^{lb} /gal) (max)	1.25

Quantitative Requirements of Yellow Solvent Based Paint

Characteristics	Low VOC Type F
Lead Chromate (as % of Extr. Pigment) (min) (Pure)	16.7
Pigment (%)	50.0–52.0
Total Solids (%) (min)	69.5
Vehicle Solids (%) (min)	38.0
Weight per Gallon (lbs) (min)	11.3
Viscosity (K.U.)	70–85
Fineness of Grind (Hegman) (min)	2.0
Drying Time (Minutes) (max)	10.0
Color (to pass Fed. Std.) (Chip #33538)	
Directional Reflectance, (%) (min)	50
Uncombined Water (%) (max)	1.0
Particles and Skins Retained on 325 Mesh Sieve (%) (max)	1.0
Volatile Organic Content (^{lb} /gal) (max)	1.25

Delete the table "Quantitative Requirements of Water Based Paint" in Section 880.01 C. and insert the following:

Quantitative Requirements of Water Based Paint

Characteristics	White	Yellow
Pigment (%)	58–62	57–61
Titanium Dioxide, (%) (min), Pure TiO ₂ as % of pigment (Rutile II)	12.20	2.50
Acrylic Emulsion Vehicle		
Resin solids (%) (min)	43.0	43.0
Total Solids (%) (min)	76.1	75.1
Weight per Gallon (lbs) (min)	13.0	12.7
Fineness of Grind (Hegman) (min)	3.0	3.0
Viscosity (K.U. @ 77°)	80–100	80–100
pH (min)	9.6	9.6
Color (Fed. Std. Chip #33538)		
CIE Chromaticity Limits		x ₁₀ = 0.470–0.530 y ₁₀ = 0.429–0.483
Drying Time (Minutes) (max) (ASTM D-711)		
12 mil wet thickness @ 77°F.:		
@65%R.H.	12.0	12.0
@90%R.H.	75.0	75.0
Contrast Ratio @ 15 mils wet (%) (min)	98.0	96.0
Directional Reflectance, Daylight (%) (min)	83	39.5
Volatile Organic Content, (lb/gal) (max)	1.25	1.25

Delete the first paragraph of Section 880.01 C. and insert the following:

The vehicle resin solids shall be composed of a 100% acrylic polymer such as Rohm and Haas E-3427, or equivalent.

Delete Section 880.05, Preformed Plastic Marking Film, in its entirety.

Delete Section 880.08 in its entirety and insert the following:

880.08 SHORT-TERM PAVEMENT MARKING.

Short-term pavement marking, placed on the top lift of asphalt paving projects and after final brooming on seal coat projects, shall meet Section 880.01. Pavement marking paint for short-term pavement marking, on the lower lifts of asphalt paving projects and before final brooming on seal coat projects, may be commercially-available traffic marking paint, and shall be yellow or white in color.

Mixed commercially-available traffic marking paint shall show no signs of thickening, caking, livering, or curdling, and shall be free of water, skins, and any other foreign materials. At the time of application, the mixed

paint shall be capable of being easily stirred with a paddle to a smooth, uniform consistency. The paint shall dry to an elastic, adherent finish that will not discolor in sunlight.

Glass beads for short-term pavement marking shall meet Section 880.02.

Pavement marking tape for short-term pavement marking shall be 4 inches wide with a pressure-sensitive adhesive backing and have reflectorizing glass beads embedded in the surface. The tape shall be durable and function effectively for the required period of service and adhere to the pavement surface.

894.05 POSTS AND HARDWARE FOR SIGNS.**Page 506****02-19-99**

Add the following sentence to Section 894.05 B.4.e.:

All metal shall be removed from the punched holes.

894.08 STRUCTURES FOR OVERHEAD SIGNS.**Page 513****02-18-00**

Delete the sixth paragraph of Section 894.08 B.7 and insert the following:

Washers shall conform to ASTM F 436 for circular washers.

Delete the words "Type A" of the first sentence of the seventh paragraph of Section 894.08 B.7.

896.01 GENERAL.**Page 58, Vol. 2.****07-17-98**

At the end of Section 896.01 add the following paragraph:

All hardware and software shall process dates and date-related data accurately prior to, during and after the year 2000. This will include accurately inputting, storing, manipulating, comparing, calculating, updating, recording, displaying, outputting and transferring such dates and data.

896.03 CONDUCTORS.**Page 59, Vol. 2****07-16-99**

Delete Section 896.03 B.4 in its entirety and insert the following:

Preformed Loop Detector: The Performed Loop Detector shall be constructed of PVC and loop conductor. The loop detector shall be totally encased in 1/2" schedule 40 PVC, (sprinkler pipe, heavy wall construction) with pipe fittings and glue. One corner shall be terminated with a 1/2" PVC tee fitting to provide an exit to the pull box conduit. The PVC is to be sealed at the joints with water pipe fitting glue to prevent water entrenchment. The conductor shall be No. 14 AWG, Type XHHW or THHN or THWN, 600 V stranded single conductor. The loop shall be constructed from a continuous piece of conductor with no splices throughout the entire length to the pull box. Three turns shall be placed in the preformed loop. The conductor from the loop to the pull box shall be twisted to provide a minimum of two to five turns per foot.

896.03 CONDUCTORS.**Page 60, Vol. 2****07-16-99**

Add the following paragraph as Section 896.03 B.5:

Microloop Probe: The microloop probe shall be a small, cylindrical, passive transducer of earth's vertical magnetic field intensity into inductance. It transforms changes in magnetic field intensity into inductance changes which can be sensed by loop detector units. Probes shall fit vertically in 1" holes and lead-in cable in 3/8" saw slot or in sand in the roadway base. Microloop probes can be connected in series with other microloop probes or conventional wire loops. The microloop probe shall operate under the following parameters: Earth's Vertical Magnetic Field (0.2 to 1.0 oersted), Inductance (20 microhenries to 25 microhenries per probe plus 20 microhenries per 100' of wire), DC Resistance (0.5 ohms per probe plus 3.2 ohms per 100' of wire) Transducer Gain (typically 3.5 microhenries per oersted at 0.4 OE ambient vertical field intensity), and Sensitivity with 2 probes (7.0 microhenries per oersted at 0.4 OE ambient vertical field intensity). The microloop probes shall operate at a temperature range of -35°F to +165°F (-37°C to +74°C) and at humidity of 0 to 100%. The microloop probes shall detect all motorized vehicles.

Delete Section 896.08 A1 in its entirety and replace with the following:

1. **General.** The design of the signal head shall allow for the addition of a signal section with the aid of simple tools and the addition of certain standard parts. All signal heads, lamps or a light-source using Light Emitting Diodes (LED) shall conform to the latest standards of the Institute of Transportation Engineers. All exposed screws and fasteners shall be 1808, Type 304 stainless steel.

Add to the end of Section 896.08 A3.

The LED signal module shall fit into the traffic signal housing built to the Equipment and Materials Standards of the Institute of Transportation Engineers.

Add the following to Section 896.08.A

- A. The Contractor may choose to furnish signal heads using circular lenses using either incandescent lamps as a light source or a LED light source. He may provide a combination of signal sections using circular lenses using incandescent lamps as the light source and/or LED as a light source.

Delete Section 896.14 K.11 in its entirety and insert the following:

11. Detector test switches shall be provided in the controller cabinet to call vehicular and pedestrian phases. Detector test switches shall be installed for the testing of vehicular passage movements, vehicular presence movements, and pedestrian movements. Detector test switches shall not be tied to calling detector loops where passage detection is used. These switches will be used to verify the operations of the signal controller and validate the routing of detection inputs.